

Patent Claims

1. A product comprising a sensor, by means of which a measurement variable which corresponds to a reactance and which is within a measurement range can be supplied, having a matching network and having a surface acoustic wave element, with the sensor being connected via the matching network to a first reflector in the surface acoustic wave element, and the first reflector together with the matching network and the sensor forming a resonator, wherein the matching network is formed in such a way that, for a value of the measurement variable within the measurement range, the resonator has a resonance with respect to a reflection of a surface acoustic wave, which propagates on the surface acoustic wave element, on the first reflector.
2. The product as claimed in claim 1, in which the resonance is governed by the maximum reflectivity of the first reflector.
3. The product as claimed in claim 1, in which the resonance is unique within the measurement range.
4. The product as claimed in claim 1, in which the measurement variable is a capacitance.
5. The product as claimed in claim 4, in which the matching network is an inductance connected in series with the sensor.
6. The product as claimed in claim 1, in which the surface acoustic wave element has a second reflector.
7. The product as claimed in claim 6, in which the second resonator is not switched.

8. The product as claimed in claim 1, in which the surface acoustic wave element has an electroacoustic transducer, to which an antenna is connected.

9. A method for determining a measurement variable, which corresponds to a reactance, within a measurement range by a sensor, which is connected via a matching network to a first reflector in a surface acoustic wave element, and which, together with the first reflector and the matching network, forms a resonator, comprising the following steps:
- a) providing the matching network in such a way that the resonator has, for a value of the measurement variable within the measurement range, a resonance with respect to a reflection of a surface acoustic wave, which propagates on the surface acoustic wave element, on the first reflector;
 - b) generating a surface acoustic wave which propagates on the surface acoustic wave element;
 - c) generating a first reflected acoustic wave by reflection of the surface acoustic wave on the first reflector;
 - d) receiving the first reflected surface acoustic wave; and
 - e) determining the measurement variable from a phase of the first reflected surface acoustic wave.
10. The method as claimed in claim 9, in which the surface acoustic wave is converted from an incoming electromagnetic signal and the reflected surface acoustic wave to an outgoing electromagnetic signal, and the measurement variable is determined from the outgoing electromagnetic signal.
11. The method as claimed in claim 10, in which the incoming signal is received via an antenna, and the outgoing signal is transmitted via the antenna.
12. The method as claimed in claim 9, in which a second reflected surface acoustic wave is produced by reflection of the surface acoustic wave on a second reflector in the surface acoustic wave element, the second reflected surface acoustic wave is likewise received, and the measurement variable is determined from a phase difference between the first and the second reflected surface acoustic waves.

13. An arrangement for determining a measurement variable, which corresponds to a reactance, within a measurement range comprising a sensor, which is connected via a matching network to a first reflector in a surface acoustic wave element, and which, together with the first reflector and the matching network, forms a resonator, wherein the matching network is formed in such a way that the resonator has, for a value of the measurement variable within the measurement range, a resonance with respect to a reflection of a surface acoustic wave, which propagates on the surface acoustic wave element, on the first reflector, and wherein the arrangement further comprises :
- a) means for production of a surface acoustic surface wave which propagates on the surface acoustic wave element;
 - b) means for production of a first reflected surface acoustic wave produced by reflection of the surface acoustic wave on the first reflector; and
 - c) means for determination of the measurement variable from a phase of the first reflected surface acoustic wave.
14. The arrangement as claimed in claim 13, wherein the arrangement comprises an electroacoustic transducer on the surface acoustic wave element, an antenna connected to it, and an evaluation appliance which is mechanically separate from the sensor and from the surface acoustic wave element.
15. The arrangement as claimed in claim 14, wherein the evaluation appliance has a transceiver for producing an incoming electromagnetic signal, which is to be transmitted to the antenna and is to be converted by the transducer, and for receiving an outgoing electromagnetic signal, which is converted by the transducer, and has a phase discriminator for determining the measurement variable.